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FORMAT

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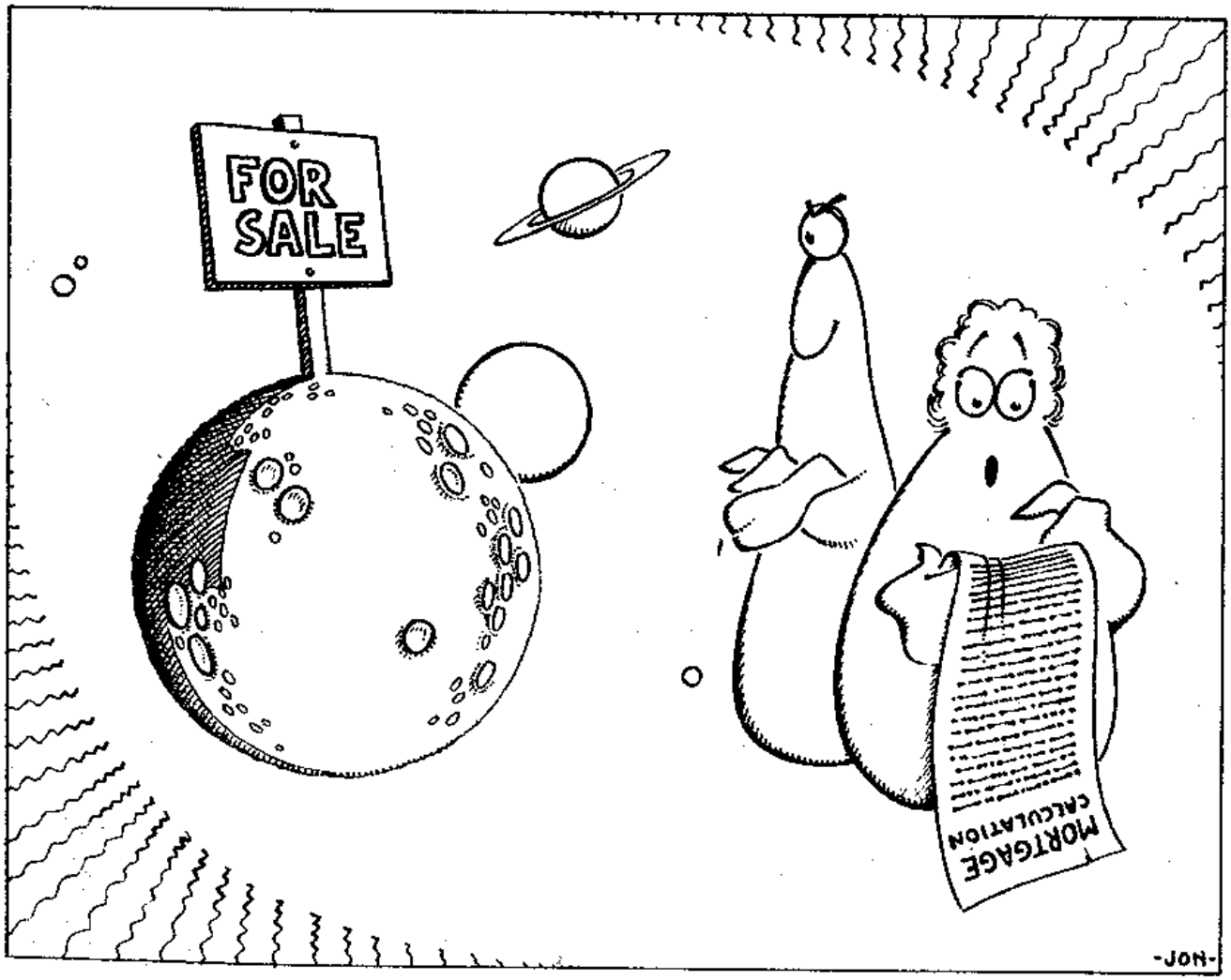

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SHORT • SPOT

By:- John Wase.

Let's start with the DTP program "Wordmaster". SAM users will be pleased to hear of SAMTAPE 3 by LERM Software - like SAMTAPE 2 only better. Improvements include a choice of disc or tape type, a choice of speed for tape saving, improved snapshot reliability, screensnaps, a compression routine (useful for tape) and, best of all, a patch for "Wordmaster": the 48K Spectrum version will now work in Spectrum emulation mode. Carol Brooksbank, I gather, had a hand in that, and one of her difficulties was the number of versions kicking around. L.A.Taylor of Epsom writes to complain that Mr Spencer's pokes published previously (intended to improve the rather unreadable character set) don't work. No, Mr. Taylor, I doubt if you're doing anything wrong - probably poking an empty area of memory which will be used subsequently for storing files. It's just that you've got a different version. Contact Barry Parkinson of PGC, quoting the version number, and ask him the start address of the character set. Poke some numbers into the addresses given and others in that area until you've distorted one of the letters. Now you've hit the right area. Continue until you've hit the right address (the first letter which needs modifying). Make a note of this address and calculate the offset from the address in Mr Spencer's program, add that to all the other pokes and all should be well. O.K?

Chris Brown has sent in a series of "games of chance" designed for school Fetes and so on. Like you fix up a Spectrum on the stall and invite the punters to compete, offering prizes. I understand he charges £3.00 for the lot on a PLUS D disc. Enquiries and Fund Raisers' orders to 45 Medway Avenue, Witham Essex CM8 1TF. He also encloses a copy of "SECTSEARCH" - a PLUS D disc searcher which prints track/sector positions of directory/program start, whilst the sector map shows the positions of each "next sector" of the program. Entries can also be deleted and undeleted, so now you can search your error-bound PLUS D disc. Just one thing - I'm testing Andy Wright's new DOS, and don't particularly want to load things that mess about with the directory, so it's not tested. Here you are:-

```
 1 INK 0: PAPER 6: BORDER 6: CLS : F
   OR x=0 TO 3: FOR y=1 TO 10
 2 LOAD @1,x,y,45000
 3 LET a$="": LET b$="": FOR a=45001
    TO 45010: LET a$=a$+CHR$ (PEEK a
   ): LET b$=b$+CHR$ (PEEK (a+256)):
    NEXT a
 4 IF PEEK 45013<>0 OR PEEK 45270<>0
    THEN  PRINT "DIRECTORY: TRACK ";
   x;"  SECTOR ";y''"A ";a$;("DEL" A
   ND PEEK 45000=0),"SECTORS USED  "
   ;PEEK 45012'"      TRACK ";PEEK 4
   5013,"SECTOR ";PEEK 45014''"B ";b
   $;("DEL" AND PEEK 45256=0),"SECTO
   RS USED  ";PEEK 45268'"      TRAC
   K ";PEEK 45269,"SECTOR ";PEEK 452
   70'"     ----------------------"
 5 IF PEEK 45013=0 OR PEEK 45270=0 T
   HEN  NEXT y: NEXT x: PRINT #1;AT
   1,0; INK 1; PAPER 5; BRIGHT 1;"**
    NO MORE FILES ON THIS DISC **";
   BRIGHT 0; INK 0; PAPER 6;"Press d
   elete / enter / edit(new)": GOTO
   8
 6 POKE 23692,255: PRINT #1;AT 1,0;
   INK 2; PAPER 6; BRIGHT 1;;"NEXT P
   AIR-space SECTOR MAP-enterNEW DIS
   C-edit   UN/DELETE-delete"
 8 IF INKEY$="" THEN  GOTO 8
10 IF CODE INKEY$=32 THEN  PRINT #1;
   AT 1,0,,,,: NEXT y: NEXT x: GOTO
   5
11 IF CODE INKEY$=7 THEN  GOTO 1
12 IF CODE INKEY$=12 THEN  GOTO 50
14 IF CODE INKEY$=13 THEN  INK 7: PA
   PER 0: INPUT "TRACK  "; LINE a$:
   INPUT "SECTOR  "; LINE b$: INPUT
```

```
    "SECTORS USED  "; LINE c$: INK 0:
     PAPER 6: GOTO 18
 15 GOTO 6
 18 CLS : LET z=2:  LOAD @1,VAL a$,VA
    L b$,45000
 20 IF PEEK 45510<>0 AND PEEK 45511<>
    0 THEN  PRINT z;"  TRACK ";PEEK 4
    5510;"   SECTOR ";PEEK 45511: GOT
    O 35
 30 GOTO 5
 35 PRINT #1;AT 1,0; INK 2; PAPER 6;
    BRIGHT 1;" SECTOR NUMBER  SECTORS
     USED ";c$
 40 PAUSE 0: LET z=z+1: LOAD @1,PEEK
    45510,PEEK 45511,45000: POKE 2369
    2,255: PRINT #1;AT 1,0,,: GOTO 20
 50 INPUT "DIRECTORY TRACK "; LINE a$
    : INPUT "DIRECTORY SECTOR "; LINE
     b$: INPUT "LINE 'A' OR 'B' "; LI
    NE c$
 55  CLS : PRINT AT 5,5;"FILE DESCRIP
    TOR TYPES"'';"0   DELETE FILE / D
    ELETED FILE"'"1   BASIC FILE "'"2
       DATA ARRAY"'"3   STRING ARRAY"
    '"4   CODE FILE"'"5   48K SNAPSHO
    T"'"6"'"7   SCREEN SNAPSHOT"'"8"'
    "9   128K SNAPSHOT"'"10"'"11": IN
    PUT "FILE TYPE "; LINE d$
 60 LOAD @1,VAL a$,VAL b$,44000
 65 IF c$="a" OR c$="A" THEN  POKE 44
    000,VAL d$
 66 IF c$="b" OR c$="B" THEN  POKE 44
    256,VAL d$
 70 SAVE @1,VAL a$,VAL b$,44000: CLS
    : GOTO 2
1000 FOR x=45220 TO 45512: PRINT x,PEE
    K x,CHR$ (PEEK x): PAUSE 0: NEXT
    x
```

Next, the "PRINT USING" programs (see Vol 3 No 12). It looks as though these have stirred up rather a hornet's nest. For instance, Ray Bray of Porton, Salisbury, has written to say that he was interested to see Istvan Ordog's program in August, and that for five years, he has been using a short procedure to do the same task on a 48K Spectrum: now he has modified it to make use of the improved basic of SAM which allows a more elegant solution.

The listing is for universal application and allows the user to specify on each occasion the number of decimal places and the length of the printing string (in the example, these are 2 and 7 respectively). If a standard layout is used throughout the program, then constants can be used in the procedure insted of having to nominate the variable each time.

```
  5 REM **NUMBER FORMATTING PROGRAM**
 10 REM********BY RAY BRAY***********
 20 REM The example given calls for
    2 decimal places and a string
    length of 7 characters
 30 :
 50 INPUT "Enter number. ";q
 60 FORM 2,7
 70 PRINT p$
 80 STOP
 90:
1000 DEF PROC FORM dec,chs
1010 LET q1$=STR$ ((q-INT q)+(5/10↑(de
    c+1)))
1020 LET q2$=(STR$ (INT q))+q1$(2 TO
    dec+2)
1030 LET p$=STRING$(chs-LEN (q2$)," ")
    +q2$
1040 END PROC
```

Ray also mentions that the procedure also rounds-up the decimal places where appropriate: if this is not required, merely alter the term (5/10↑(dec+1)) in line 1010 to (1/10↑(dec+1).

And Harold Griffiths of Aylesbrook, Hereford, writes with a program again on "PRINT USING" which should work on both SAM and Spectrum.

```
  2 REM***BY HAROLD GRIFFITHS***
 10 REM Writ on a Spectrum
 20 REM But SAM should cope
 30
 40 REM Entry;x=number
 50 REM Entry;;pc"=d.p. column
 60 REM Output;x$ with 2 d.p.'s
 70 REM Output;"tp"=tab position
 90 REM For numbers up to 1e7
 85
 90 REM ***USING$ SUBROUTINE***
100 LET li=INT (LN x/LN 10)+1+(x<1):
    REM len int
110 LET y$=STR$ (x+.001)
120 LET tp=pc-li: REM Tab position
130 IF LEN y$=li THEN LET x$=y$+".00"
    : RETURN : REM If whole number
140 IF LEN y$=li +2 THEN LET x$=y$+"0
    ": RETURN : REM 2nd dec. place if
    none
```

```
150 LET x$=y$( TO li+3): REM To 2nd d
    . place
160 RETURN
170
190 REM DEMO
200 CLS : LET pc=20: REM "Point" col.
210 LET x=7654321: REM x<1e7
220 GOSUB 100
230 LPRINT TAB tp;x$
240 IF X>.1 THEN LET X=X/10: GOTO 220
```

Harold appends some cheeky REMs to ask if Istvan had been over celebrating - he reckons his own routine is neater: it works and it doesn't jump out of a loop. Over to you, Istvan.

While we're on the subject of "PRINT USING", here's a contribution from Damian Tull that's just a bit different, but still concerns the formatting of output. You will remember that all I had from Damian was a microdrive file which I couldn't get to go into Tasword+2, and which, frankly seemed to have nothing on it - I tried moving it to #2, and didn't get anywhere with that, either. Please, do try and make things easy for me. I've got quite a job to put "Short spot" together as it is, for it's not my only job. This month, for instance, I have typed several program listings into the wordprocessor file, a fairly exacting task that takes quite a lot of time. I have only so much that I can put aside and if you send long programs without a cassette or disc, or incomprehensible ones, or beautiful programs with lots of undocumented machine code that I can't unravel or get a listing for, they are less likely to be included. Do also remember that not everyone has an assembler or is fluent in assembly language - please, where possible, provide a decimal listing (you've got no excuse with SAM now Carol's provided her little program). Enough of the gripes; let us get on with Damian and "PRINT USING". Damian tells me that he had to go down the road to his mate Neil Bibby to write this, because he sold him all his gear a couple of weeks previously so that he (Damian) could save for a SAM. Now that SAMCO is up and running I hope you get it soon. What Damian's program does, as far as I can see, (and it is untested, I warn you), is to use a format: like if you are printing twenty three as five figures, it will print "00023", although his explanation is still a little obscure, and I am not sure of all its capabilities. Anyhow, try it. First the machine code. This runs from address 32768, and for those with no assembler, here's a "code poker". Type it in, run it and it will save as "DP_CODE".

```
10 RESTORE: CLEAR 32767: LET b=32768
   : FOR a=b TO b+38: READ datanum :
   POKE a, datanum : NEXT a
20 SAVE D1"DP_CODE" CODE 32768,39
30 DATA 33,0,0,229,6,5,229,120,33,1,
   0,84,93,41,41,25,41,61,32,247,225
   ,167,60,237,82,48,250,25,198,47,1
   97,229,215,2 25,193,16,225,225,20
   1
```

Now try it with the little test program. Type it in and then do SAVE D1"TESTER"LINE 60. I warn you, though - it takes rather a long time to run when you try it.

```
 5 REM *******tester**********
 6 REM *****by Damian Tull****
10 FOR X=0 TO 65535
20 LET NUMBER=X
30 POKE 32769,NUMBER-(INT (NUMBER/25
   6)*256): POKE 32770,NUMBER/256: P
   RINT AT 0,0;"NUMBER=";
40 RANDOMIZE USR 32768: NEXT X
50 STOP
60 LOAD D1"DP_CODE"CODE 32768
70 CLS : GOTO 10
```

Now, what's going on. Well, here's an assembler listing from Damian which is fairly well documented.

```
 10 ;Decimal Number Print for FORMAT
 20 ;Written by Damian Tull with help from
 30 ;Neil Bibby
 40
 50 ;This program will print any 16 BIT number
 60 ;in decimal to the screen.
 70 ;Enter program with HL containing the number
 80 ;to be printed (HL is preserved during the
 90 ;process), and the program will print the
100 ;number in HL to the screen in 5 digits.
```

```
110 ;ie. 23 will appear as 00023.
120 ;The program finds out the correct digit of
130 ;the number to be printed and adds the right
140 ;number of zeros ie. 10000 for 54321, 1000
150 ;for 4321, 100 for 321 etc.
160 ;Once the correct number has been found, the
160 ;program finds out the correct digit to be
170 ;printed by working out how many times the
180 ;new found number can be taken from the
190 ;number in HL without HL going below zero.
210 ;ie. 10000 goes into 34567 3 times and 1000
220 ;goes into 4567 4 times etc.
230 ;When the number has been found it is then
240 ;printed to the screen. This version uses
250 ;RST 16 to print the number but any system
260 ;can be used as long as it protects BC and
270 ;HL from corruption.
280
290 DECPRT PUSH HL
300        LD   B,5
310 DP1    PUSH HL        ;Save HL
320        LD   A,B
330        LD   HL,1
340 DP2    LD   D,H
350        LD   E,L
360        ADD  HL,HL     ;HL = HL + HL
370        ADD  HL,HL     ;HL = HL + HL
380        ADD  HL,DE     ;HL = HL + DE
390        ADD  HL,HL     ;HL = HL + HL
400        DEC  A
410        JR   NZ,DP2    ;Loop if A <> 0
420        POP  HL        ;Retrieve HL
430 DP3    AND  A         ;Set carry flag to 0
440        INC  A
450        SBC  HL,DE     ;HL = HL -DE
460        JR   NC,DP3    ;Loop if DE > HL
470        ADD  HL,DE
480        ADD  A,47      ;Prepare A for Printing
490        PUSH BC
500        PUSH HL
510        RST  16        ;Print the character
520        POP  HL
530        POP  BC
540        DJNZ DP1       ;Loop until finished
550        POP  HL
560        RET
```

...though, being as thick as usual, I still can't exactly find what he's up to. Can you?

As I mentioned, his original file was a microdrive file on a PLUS D disc, and earlier on I had a cry for help from someone who was using microdrive files for something and couldn't duplicate them on the PLUS D without extraordinary difficulty. Well SD Software now do a utility program that converts MD files to their DOS equivalents or back again.

Anyway, back to a little piece by Ettrick Thomson in which we continue the tradition of printing two versions, one for SAM and the other for a Spectrum: and yes, we're back on "Mathographics" again...

This is a little program for a C-shaped curve.

```
  5 REM*** C-shaped curve ***
  6 REM*** By Ettrick Thomson ***
  7 REM*** Spectrum Version ***
 10 INPUT "depth"(>0);";n: PRINT n
 20 DIM a(n): DIM b(n): DIM (c)n: DIM
    (d)n
 30 PLOT 64,32
 40 LET x1=64: LET y1=32: LET x2=192:
    LET y2=32
 60 GOSUB 100
 70 STOP
100 IF n=0 THEN DRAW x2-x1,y2-y1: RET
    URN
110 LET x3=(y1+x1-y2+x2)/2: LET y3=(y
    1 -x1+y2+x2)/2
120 LET a(n)=x2: LET b(n)=y2: LET c(n
    )=x3: LET d(n)=y3
130 LET x2=x3: LET y2=y3
140 LET n=n-1: GOSUB 100: LET n=n+1
150 LET x1=c(n): LET y1=d(n): LET x2=
    a(n): LET y2=b(n)
160 LET n=n-1: GOSUB 100: LET n=n+1
170 RETURN
```

And here's Ettrick's somewhat more elegant Beta Basic/SAM version. (Incidentally, I noticed that in his Spectrum version, Ettrick assigned a number of variables with a single LET, so I've corrected this - I guess he wrote it using Beta Basic. This illustrates how one gets used to a program, and also that even on the Spectrum, Beta Basic is much more elegant than the original Basic).

```
  5 REM*** C-shaped curve ***
  6 REM*** By Ettrick Thomson ***
  7 REM*** Spectrum Version ***
 10 INPUT "depth"(>=0);";n: PRINT n
 20 PLOT 64,32
 30 ccurve n,64,32,192,32
 40 STOP
100 DEF PROC ccurve n,x1,y1,x2,y2
```

```
110 LOCAL x3,y3
120 IF n=0 THEN DRAW x2-x1,y2-y1 ELSE
    LET x3=(y1+x1-y2+x2)/2,y3=(y1-x1+
    y2+x2)/2: ccurve n-1,x1,y1,x3,y3:
    ccurve n-1,x3,y3,x2,y2
130 END PROC
```

Ettrick also mentions that the two points (x1,y1),(x2,y2) in the call are treated as the diagonal of a square; (x3,y3) is that corner of the square on your left as you go from (x1,y1) to (x2,y2). The same treatment is applied to the two sides of the square, producing four sides; these are then used to produce eight, and so on for n stages: then lines are drawn connecting the resultant set of points.

Recently, my post has been full of continuing sagas. Here's the latest on the "Code file length story on SAM" from Dave Marriott. Dave writes that I was right (I'm not always right, Dave), his method was a bit dodgy, and the values he gave worked only with the earlier ROM and DOS. So he's come up with a revised version. It seems a copy of the file header (as per pages 53/54 of the Technical Manual) is stored at DVAR 284 (229805 on a 256K machine) and the size for the code file is held in +37, +38 and +39 of this header, but in an obscure format: +37 (DVAR 318) holds the size divided by 16384, and +37/+38 (DVAR 319/320) hold the remainder, but with 32768 added. The size can hence be given by:-

```
16384 * PEEK DVAR 318 + DPEEK DVAR 319
 - 32768
```

Dave was surprised to find it works without brackets, so it seems that the DPEEK and the DVAR both take precedence over the minus sign. Dave also confirms that as it's not documented, this is probably not the most satisfactory way of doing it....

Here's a short program, also by Dave, for restoring default KEY and DEF KEYCODE assignments without having to reboot. Dave has found one of the problems of programs like Tasword - when you get fed up and NEW the machine, the keys end up still reassigned: a perfect pest. This little program sorts things out.

```
10 LOAD "ORIGKEYS" CODE: LOAD "ORIGD
   EFS" CODE: STOP
20 SAVE "ORIGKEYS" CODE DPEEK SVAR 4
   72,288
30 SAVE "ORIFDEFS" CODE DPEEK SVAR 4
   62, DPEEK SVAR 464 - DPEEK SVAR 4
   62+1
```

Run the program from line 20 after booting up, to save the default definitions (or your own customised ones), and then save the program to run from line 10. (Lines 20 and 20 aren't needed after the first run, but Dave leaves them in for documentation)

From the memory map in the Technical Manual, it appears that the two lots could be saved as one contiguous block, but in fact the DEF KEYCODE area stops short of the KEYS area which sits above it (DPEEK SVAR 464 points to its upper limit), and part of the area between here and the KEYS area is used by the Floating Point Calculator Vector (DPEEK SVAR 240): overwriting this causes a crash. Many thanks, Dave.

Talking of ROM differences, Charles Boyle of unknown address in Ealing thrust a disc for me into Bob's hand at the last All Formats Computer Fair at London. It does absolutely nothing on my SAM. It has a lot of data which it pokes into appropriate addresses, then calls it and just sits there, squittering to itself with a blank screen. My SAM's a 512K ROM 3.0 version - could you check it out, please, Charles?

And that's this month's column overfilled. Do remember, though, that I can't fill it without your contributions. Please do send them to:-

John Wase,
Green Leys Cottage,
Bishampton,
Pershore,
Worcs, WR10 2LX.

Thank you.

D.B.U. & I.B.U. Reviewed

By:- Carol Brooksbank.

Backing up your discs is always a pain, especially if you have only one disc drive and a lot of files to copy. Those 'Put source disc in drive 1' 'Put destination disc...' messages seem to be interminable. But of course, as soon as you get fed up of the whole thing and decide not to bother, disaster strikes and your most vital files are lost for ever. These two programs come to the rescue for DISCIPLE/PLUS D (D.B.U.) and Sam (SAM IBU) owners.

D.B.U. comes on tape, but on loading automatically saves itself to disc. It offers a menu of options - source and destination drive number; file names (wild cards are available and "*" saves all files to the new disc under their original names); updating only or copy everything; set archive or not; overwrite existing files with the same name automatically or stop with an 'Overwrite?' prompt.

When you make the first backup copy of a disc, you still have to swop discs for every file copied if you have only one drive, but if, at this stage, you opt for archive set, a marker will be put in the directory entry for each file copied. When you next back up the disc opt for update only, and only the files without the archive marker will be copied. You don't even have to remember which files you have changed. New files or any which have been re-saved will be without the marker and will be backed up.

The program copies any type of file, BASIC, code, SCREEN$, OPENTYPE and Snapshots were all handled correctly. I detected only one slight oddity. If you back up onto a disc which already has files on it, they will not be lost and the backups will be slotted into directory spaces as usual. If you copy a snapshot file which you have not renamed, so it is still called, say, 'Snap T', it may not go into the directory slot which usually houses Snap T, though it will still have that name. This could cause trouble later if you try to make a new snapshot which is in the Snap T slot. Moral - always rename your snapshots.

If you have two drives, you can set this program to do its work with the source disc in one drive and the destination in the other and go away for a cup of coffee. One-drive owners will still have to stick around and swop the discs, but once the original backup is made, the archive option will keep copying to the essential minimum.

SAM IBU is a very similar program for SAM, but because of the extra memory available it is able to work more smoothly, even if only one drive is available. Again, with two drives, the whole operation can be done without any disc swopping at all.

Unlike the Spectrum program, you cannot back up a Sam disc to one which has other files on it already without losing those existing files. At the end of the operation you will be left with two identical discs. The source and destination directories are compared, and any files which are on the source disc but not the destination one will be listed as files to be copied. At this stage you can quit or continue with the copy.

One drive owners are prompted for disc changes as necessary, but numerous files are copied at once - I did not have a full Sam disc, and could not find one which required even two 'bites', though I suspect more disc changes would be needed with the 256K Sam. The archive marking is not

optional with SAM IBU, but if you prefer not to use it, you can write protect the source disc. When the program stops with the 'disc write protected' message you type 'RETURN' and the backup is made without marking the source directory.

These two programs will be a great help to those of us who are rather lazy about backups. They cut the work down by copying only those files which have been changed, and they will even remember for you which those files are. Perhaps those nasty moments when the 'End of File' message tells you that the only copy of a file is corrupted will be things of the past now.

Both programs are available direct from:- SD Software, 3 Mitchell Place, Falkirk, Stirlingshire, Scotland, FK1 5PJ.

Prices:- D.B.U. £5.50 (£4.00 for INDUG members).
SAM IBU £4.90 (£3.50 to INDUG members).

TWO TIMES EIGHT ISN'T ALWAYS SIXTEEN

By:- Alan Miles.

Sometime back before Christmas, our good friend John Minson wondered in a Guardian article he wrote about the SAM Coupé whether Bruce Gordon and I were mad. John had no doubts about the capabilities of the computer we were then just about to bring to the market, but he made the point that a small company would find it very difficult to compete against the giants of the leisure computing market, against established brand names and tastes.

Well maybe John was right. Perhaps we are a little crazy. Crazy to have started the whole thing in the first place, four years ago; crazy to have allowed MGT to grow so quickly; and crazy after the trauma of receivership to be trying to start the whole thing all over again with SAMCO.

But whether you judge a person to be mad or not depends on your perspective. We've all heard the saying "History favours the victor" (have I quoted that correctly?), and it's certainly true. Are you a saint or a fanatic, a terrorist or a freedom-fighter, a madman or a visionary? No, I'm not trying to claim that we're visionaries, but we feel we do have certain beliefs about the products we sell and insights into the way we do things in our industry which are still valid.

So what are they? Well, try these for starters:-

A COMPUTER IS NOT A KETTLE....

and the people who buy computers have different expectations from the people who buy kettles. Most consumer appliances that we buy for our use in the home are well-known and well-understood by everyone. You simply switch it on and it works. It's predictable and limited: it always does the same thing every time. It's true that computers can be used like this - although anyone who wants to do so would be well-advised to buy a games console. But many people - and certainly all FORMAT readers - want to do more with it. They criticise or praise the product's performance in minute detail. They're frustrated because they can't get to grips with it, or they fall in love with it because they find out how to master it.

It's a different kind of product, and it needs to be sold in a different kind of way, with a different kind of after-sales back- up.

NO COMPUTER IS AN ISLAND.....

although computer manufacturers generally seem to behave as if they were living on a desert island.

What I mean is that the computer is virtually useless without a whole range of support products, all of which are integrally related. First, there's software - that's obvious. To return to our earlier analogy, a computer without software is like a kettle without water. And yet how many hardware manufacturers take a close personal interest in the software that's being published? But it goes much further than that. The manufacturer has a responsibility to provide customer support which is wholly different from that needed by most other consumer electronics products. Repairs: given the complex nature of the product, there needs to be a service allowing the customer to actually talk through the problem to identify whether he may be doing something wrong.

And the manufacturer needs to be

involved in all of this. It's not good enough to be selling the product in isolation from the service.

TWO TIMES EIGHT ISN'T ALWAYS SIXTEEN

You've heard the arguments. "My computer's better than yours - it's 16-bit". "8-bit is old technology." Everyone says it, the manufacturers, the retailers, the shops, the public. But how many people who talk about 8/16 bit actualy understand the difference - if they did perhaps they'd realise how little relevance the whole discussion has. How much better is 16-bit than 8-bit? Twice as good? Twice as good for what? Number-crunching, perhaps - but how many home users are doing that?

Imagine the consequences if the auto press was split in this way, with magazines devoted only to cars with 2 litre engines and above, or if only high-performance cars were shown at the Motor Show. Mass-market interest would quickly evaporate and you'd be left with the buffs. But the auto industry has matured: they recognise that there are some cars that most people dream about and others that most people buy. And the public is interested - in a different way - in both.

In our industry we're busy telling the mass-market - the kids - how good the machines are that most of them can't afford. Even if they can save up the four hundred pounds for an Amiga, how many of them can afford the software they need to run on it out of pocket money? Perhaps this is why there were twice as many 8-bit (= sub 200 pound) computers sold last year as 16-bit (= sub 400 pound) computers. Now there's a sum that works: £400 is twice as much as £200.

* * * * * *

If you can understand this last point, you'll understand why we wanted so very badly to keep the SAM Coupé alive. It's not simply that we've been working with the machine for so long. Rather, we wanted to prove that you don't have to be state-of the-art (= expensive) with blitters and blotters and blathers to produce a computer that people want. You want fancy graphics? You've got it. You want stereo six-channel sound? You've got that too. You enjoy programming? Well, here's a good Basic. You just like messing around with the computer? So here's all the technical information and all the ports you need. You do your business from home? Then here's an 80-column screen for word-processing and spreadsheeting. You don't want it to burn a hole in your pocket. Well, how does 200 pounds sound for a computer with a disk drive - you can always spend more later if you want to!

People want a 200 pound computer that can do the job for them!

But are we mad? After all, we tried it once and the company failed. And we learnt. We learnt that we can't do everything ourselves. There we were at MGT designing the machine, building it, repairing it, selling it, sourcing software, taking care of customers - doing all the things we say we believe in. And not doing it very well. The trouble was - we now realise - that a small company can't grow that quickly. You can't expect to be perfect at everything at once. The people at MGT tried and tried - bless them! - but there was never time for training, never time to teach them the very special skills they needed, never time to immerse them in the SAM Coupé so that they knew the whole business as intimately as we - who had spent years with it - did. We were almost - I swallow as I write this - too successful! The product cought on so fast that the people couldn't catch up.

So what's changed? Not our beliefs. Not our faith in the product. But the way in which we run the business - yes. SAM Computers Limited will never be more than the design and marketing hub of the business, a relatively small operation, easy to administer, efficient. All right: so how can we compete with the big boys? By shifting

the terms of reference, that's how. By building a multi-faceted team of individuals and organisations who are determined to see the Coupé succeed, and who share our belief in providing personal, grass-roots support.

We've been very fortunate to have our friends rallying round in the past few months. There's FORMAT of course, providing technical help in its unique, highly personal way. There's Enigma Variations, who have done such a terrific job in bringing on new SAM software fast. There's Hollington Meyers, who are acting as our sales team, distributors to the shops. There's PBT Electronics, who offer the sort of repair service we've always wanted to see. All of these have come together to form the nucleus of TEAM SAM, a group of independent specialists dedicated to making the Coupé the best computer, and perhaps later the best-selling computer, for the home. But TEAM SAM is an informal organisation: there are countless other people who have already demonstrated their committment. Andy Wright, who helped to make it possible to get the ROM/DOS Upgrade Kit out; Bruce Everiss, who's running the SAM Hot-Line service; Bob Evans at Lerm, who has produced such good work on Spectrum compatibility; Adrian Parker with his new speech synthesizer (and more to follow); Nev Young and Steve Nutting with their utility software; John Wase with his pen.... (if I've missed you forgive me).

Are we mad - all of us? Are mountaineers mad? What do they do, if they try to climb a mountain but fail? The committed ones climb another mountain.

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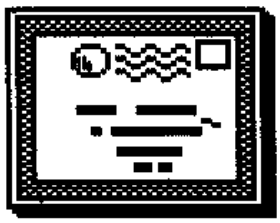
YOUR LETTERS



Dear Editor,

I enjoyed September's FORMAT and I'm pleased you chose to print my Bits of FN article. Unfortunately a little mistake crept into the very last line of the printed listing and it stops FN BTEST from passing syntax.

The exponential operator ↑ (SYMBOL H) should appear between the 2 and the N on the last line:-

```
DEF FN BTEST(N,X)=1 AND (X BAND 2↑N)
```

Readers may be interested to hear that current SAM ROMs calculate 2↑N about ten times faster than ROM 1.0! This is because of an optimization Dr Andy Wright devised when I observed that it is a common special case.

SAM BASIC optimises many operations involving the number 2 - doubling, halving and their ilk - as the Z80 can do those much faster than other arithmetic operatons. Most micros use the same 'general purpose' routines for all arithmetic, but SAM automatically uses fast integer operations whenever it gets the chance.

Yours sincerely, Simon Goodwin.

Dear Editor,

All of the major magazines are at it and now Format has joined in. Readers surveys, that is.

The results of the FORMAT survey were most interesting but were rather difficult to interpret because there was so little indication of what was going on in the vast interval between the 10 most and 10 least popular items. Any article or category occuring in the latter list but not the former would appear to be particularly vunerable.

However, I do hope that you will not eliminate any type of article (even MIDI) on the basis of this survey, that is the trap which the Spectrum glossies have fallen into!

According to their surveys, the great majority of their readers put Arcade games as their major interest and articles on minority interests (programming, strategy, adventuring, business applications, hardware etc.) have been almost eliminated. Result, a rapid drop in circulation.

What the glossies have forgotten is that many readers, regardless of their major interest, judge the overall worth of a magazine on the broad sweep of its content.

FORMAT can only maintain and increase its popularity by continuing its wide coverage, as I am sure that you intend to do.

Yours sincerely, Bob Bates.

Don't worry Bob, the mix of FORMAT is safe. As I said EVERY article was enjoyed by some people so, as we try to be as varied as possible, I wont start dropping items just because they are disliked by some people. Ed.

Dear Editor,

I have a problem that is hampering my enjoyment of my SAM Coupé. I'm running the new Dos and Rom (shipped v.promptly by SAM Computers), 256K and one drive. After a week or so of use my discs corrupt in an irritating manner; One file (it could be SAMDOS, a SNAP or a Code file) refuses to load, returning the message 'Track X Sect X Error'. If I try erasing the file it disappears - but whether or not I do this, resaving the file from a backup returns the same error message. Renaming the file works but is not helpful as files may be called from several programs, which I then have to alter. The only solution seems to be reformatting and reduplicating the whole disc from backups. Is there any way of getting around this?

I know Alan Miles reads Format so this is a good platform to speak from. I think a MOUSE for the Coupé is imperative. I use a Macintosh at work and the advantages of this type of

can't read your mind as to what to include with your order (the +3 needs a slight modifiction to an address in the memory for the LC-10 to work, so they include a sheet detailing this). When I ordred, I phoned up to see what I would need, they told me (basically, a lead, with colour-control software for my +D), and asked me for an extra £10 to cover the leads. If you don't have access to a 'phone, then write!

As for the SAM Coupé ROM episode (mostly in New Computer Express, but I'll mention it here), where people are complaining about having to pay for the v3.0 ROM, I think that it's disgusting! There they are Bruce Gordon and Alan Miles, making a new company with THEIR OWN MONEY to support the computer, when they could, quite simply, have gone off, leaving us all high and dry, and then people complain! They can't give the ROM away, because then they would be in debt, and bang goes our support.

I, personally, and going to buy all my stuff through SAMCO, because I want to support them, just as they are supporting us, and I think a heck of a lot of people agree with me.

So get off MGT's (R.I.P.) back; they made an effort to give us something that is quite rare in the industry - a successful (until four months ago) company actually talking to it's customers. Sure, they aren't perfect, but they did try to iron out any mishaps. Anyway, it's a great shame about MGT, and I hope the company who buys them out (or has bought them out - there seems to be a rumour that someone has bought them out, already) can be as good, or better, at dealing with their customers.

Thanks for a fantastic user group, and magazine,

Yours sincerely, William Easson

.

I'm sure that many of our readers will agree with your sentiments William. So far I have only received two letters damming MGT, I've lost count of the letters of support. I'm also sure Alan and Bruce will welcome your support for the new company. **Ed.**

Letters may be shortened or edited to fit on these pages.

interface are considerable. Even better if a MOUSE could eventually be included with the Coupé, it would encourage programmers to write for a WIMP environment. FLASH! desparately needs a MOUSE, especially for lefties like myself, and assemblers, word processors etc. would become much more user friendly. IBM are doing it, so why not SAM!?

Finally, thanks for an excellent mag. that never fails to interest me.

Yours sincerely, Mike Lowndes.

I dont know exactly what is happening to your discs, perhaps someone else has experienced the same thing and found a solution. In the meantime it is time we started putting pressure on SAMCO to upgrade the DOS on SAM. Now the ROM is working the shortcomings of the DOS are really begining to show. It is not even as good as the DISCiPLE / PLUS D DOS let alone good enough for an advanced machine like SAM.

Next, I thought everyone knew the only good mouse is a dead one. WIMP environments on SAM! do you realy want to straight-jacket your machine so early in its life? Having just spent 3 weeks trying (and failing) to get a PC system running under Windows 3 I can confirm that keyboards rule O.K. **Ed.**

Dear Editor,

I have been reading a number of back-issues of FORMAT, and one type of letter which cropped up a number of times was the type which attacked MGT.

Reading these, I come to one conclusion; we have been spoiled by MGT. I doubt very much whether Amstrad could get a 3.5 inch lifetime drive up and running (with free software) over the telephone, or a Star LC-10 printing in colour, and ALL ON A PLUS 3 (notorious for it's stubborness to communicate with peripherals), and PLUS D.

Others complained that LC-10s were sent out to customers without leads etc. It is the customer's responsibility to state what kind of lead is needed, and to enclose a suitable payment. MGT can't give leads away for free, becuse they are running a business, not a charity, and they

THOUGHT SPOT.

By:- Jeremy Cook.

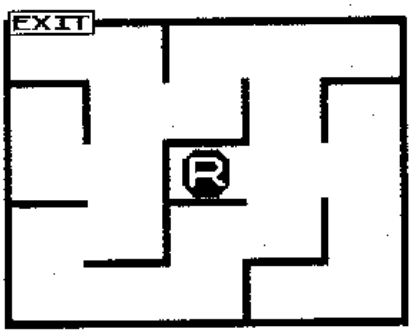
Hello and welcome. This is the FORMAT puzzle page. If you are not very good at puzzles, don't despair, you should be able to do a couple of these! Each month I will present a varied selection of problems, including number, word and logic puzzles, or anything else that might be thought provoking.

Below is this months prize puzzle, with ONE YEARS FREE subscription to FORMAT being offered for the best solution. The puzzles after that are for your amusement and frustration!

PRIZE PUZZLE NO.3: ROBERT THE ROBOT

Robert the robot is the tea maker in a hi-tech office. His last task was to get a box of teabags from stores, but due to a fierce argument with a drinks dispenser, he has blown a fuse and lost half his memory. Poor Robert now stands in the middle of the storeroom, and can't remember how to get out.

The figure below shows his position. You are Robert. Write a short program to get yourself out to the adjacent room which you remember is the repairs department.



Once you have written your program, send it to the usual FORMAT address, by 1ST December 1990. (Note that as this unlucky robot you no longer have this map in your memory and so cannot just give directions for getting out).

MONEY TROUBLES

Here are some puzzles involving coins

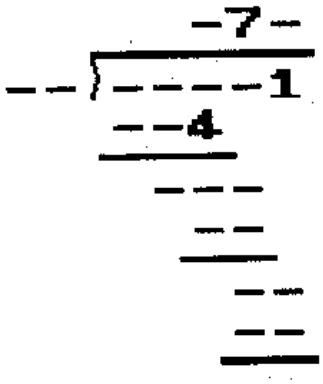
1. Take nine coins and arrange them so that there are ten rows of three coins.

2. With twelve coins make a pattern so that there are seven rows of four coins.

3. Lay twenty-one coins in twelve rows of five coins.

LENGTHY DIVISION

Here is a long division with some(!) digits missing, but there is no remainder. The "-" indicate the missing digits. Fill in the missing digits.



WORD LADDERS

The idea of these puzzles is simple. All you have to do is convert one word into another by changing one letter at a time, but each change must create a real word. For example, DOG can be changed to CAT with two link words like this:-

DOG
cog
cot
CAT

Now complete the following word ladders:-

1. LOAD to SAVE with four links

2. FOR to MAT with two links

3. COLD to WARM in three links

4. BLACK to WHITE in six links

5. BREAD into TOAST with six links

6. PESTLE into MORTAR in fourteen(!)

REBUS

A rebus (also known as a Dingbat) uses pictures, numbers and letters of the alphabet to make words and sentences. For example, "DDEE" represents "disease". Can you decipher these?

1

2

3

That is all for this month, but you still have until 1st November to do prize puzzle no.2 (September's issue). And I still welcome any response about these puzzles.

SOLUTIONS TO SEPTEMBER PUZZLES

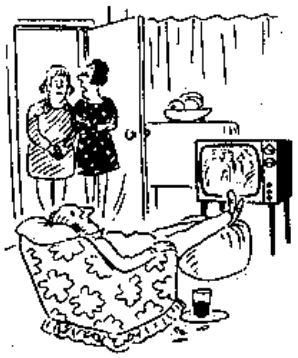
Crossnumber:-

	1 6	2 4
3 8	4	7
4 1	2	3

Mixed Doubles:- residuum, pukka, slowworm (or glowworm), bazaar, voodoo, sayyid, fishhook (or fishhawk, rushhour, withhold), zombiism.

Rebus:- 1. split second timing
2. the morning after
3. one foot in the grave
4. one by one

Kickself:- 1. She has three boys.
2. F O U RLE T T ER S
FAOPUOLRLEOTGTIERESS
A P OL O G I E S



'Certainly he has a favourite programme -- it's on every time I want any jobs done!'

C.E.S.

Report on the Computer Entertainment Show
Earl's Court 13th-16th September.

By:- Peter John.

What a shambles! This show came about because of disagreements over the old PCW show, previously at Olympia; last year at Earl's Court. There it was split, the right hand hall being entertainments, the centre a mixture and the left business. Disagreements mean that the business show now comes later, at the end of the month; the shambles I'm describing is the rump, appropriately, perhaps, relegated upstairs, where the plan's the same - three halls fanning out from a centre foyer, but the centre hall is but a gallery round the edge of the lower hall. This move has really cemented its undoing, to coin a phrase!

Thursday and Friday (the trade days) were rather quiet, but at any rate good trade business was done in this rather small show, now confined to the foyer and right hand halls. However, on Saturday, all the games punters, the family groups, rolled up and by 10 o'clock the oversmall aisles in the foyer were packed beyond danger point, the stalls could really not even be seen and the whole thing developed into a sort of scrum inside, with a queue outside snaking its way round and round Earl's Court: by mid-day, it disappeared far up Warwick Road and a four-hour wait was in prospect. Much of the problem was from the new arrangements - there was no overspill space inside. Had the boxshifters been spread around the gallery and the aisles widened in the foyer with just a few larger stands, the problem would have been far less.

I struggled through to see Alan Miles, enigmatically smiling away in his corner next to those lovely lads from Enigma Variations. They were selling "Defenders" (of course), the Enid Blyton-based "Five on a Treasure Island" adventure game, along with the book when you got bored with SAM, and a lovely multipack featuring "Futureball" and "Sam Strikes Out", a beautifully detailed platforms and ladders job standing out because of original graphics, a rather bouncy tune and original sprites. Enigma promise lots of good things in the future, including Educational programs and a fully featured word processor.

Amstrad were there, of course, po-faced about the Spectrum +3 (which they appear to be discontinuing), with their new 6128-based games console - if you've already got a 6128, don't bother to upgrade - just buy the console: you'll be better off. They filled a nice chunk of the games section, as did Commodore with their console: Atari were conspicuous by their absence.

Psygnosis had lots of games for Christmas as had Mirrorsoft with their turtles - funny how Nintendo come up with their turtlemania console and we retaliate either with a lack-lustre turtle game or by repackaging an old, old computer as a console.....

Domark and Electronic Arts were there, along with Ocean, whose fluorescent lights shone brightly over all. There was a certain amount of hardware - several lots of joystick firms like Cheetah (also with synthesizers and keyboards and Mrs. Cheetah as well, as usual): also Sinclair User, Your Sinclair and New Computer Express.

The box-shifters like Manor Court (discs in a box bargains) were at the front. All very orderly and lacklustre - by mid-day, a thin trickle of disappointed punters was drifting out of the building and forcing a way through the queues. "Nothing much there" was a typical reaction.

I guess it's a bit of a difficult time for the games industry. Mainstream computing's gone largely towards SX and 486-based P.C's; hardware much too expensive for your average home games punter, and most of the best and most addictive games ideas came out in the mid-eighties. Those who read "Byte" will recall Jerry Pournelle's complaint in the current issue about some of his wife's educational software, dismissed because the graphics are crude by present day standards, although this doesn't seem to worry the users and the programs achieve their objectives. Same with games - the old ideas seem to have to be wrapped up with more code, more detailed graphics, louder music and more hype - the games themselves are probably no better. In other words, my feeling is that the games industry is in the doldrums - and it shows. This show was, well, flat; small, but overhyped, overcrowded and overattended. If the organisers don't get their act together better next year and if the stands then have nothing more novel than at present to show, and distinctly more innovative than in this show, then I fear that the future for it is bleak.

MONEY MANAGER

By:- Carol Brooksbank.

Are you one of those well-organized people who always pays their bills on time, and never gets correspondence printed in red from British Telecom? You are? Well you don't need this program. But read on anyway, because it is designed to introduce you to the exciting world of SAM BASIC.

We shall be using quite a number of the SAM commands which are new to people coming from the Spectrum, and taking advantage of facilities like:-

CSIZE, DEF PROC, DEVICE, DISPLAY, DO, FILL USING, IF-THEN-ELSE, GET, GRAB, INSTR, LABEL, LIST FORMAT, LOCAL, LOOP, OPEN SCREEN, OPEN TO, PALETTE, PUT, SCREEN, SOUND, STRING$, SVAR, UNTIL, WHILE and WINDOW.

Those of you who don't have a SAM, but do have a SPECTRUM 128 or +2 and BETA BASIC version 4.0, should be able to modify the program without much difficulty to run on BETA BASIC, because, of course, SAM's BASIC is written by Dr Andy Wright, the author of BETA BASIC, and the two BASICs have a lot in common. The only difficulty will be that you will not have enough BASIC memory for the whole program and the calendar unless you use the silicon disc. So you will have to use the SAVE! DATA... command for the calendar. And you will also have to make each of the main menu options a subroutine kept on the silicon disc. The main menu will have to fetch the subroutine from the silicon disc into memory when an option is selected, and the last thing each option does before returning to the main menu must be to delete itself. There will be one or two items in the program you have to drop, because BETA BASIC does not have an equivalent command, such as those places in the program where we use SAM's GRAB and PUT. Some of the syntax is slightly different.

The program itself isn't a sophisticated spreadsheet. It is just a utility to help those of us who would have paid the gas bill but we were taken unawares by a reminder from the Inland Revenue and a final demand for the community charge.

It keeps a note of all your regular bills, when they are due and how much they will be, watches over the money you have in the bank, in the building society, under the bed, up the chimney, or wherever you keep your nest egg, and tells you how much you can afford to spend now, and how much must stay where it is ready for the bills.

It is a very long program, so it is going to be quite a serial story to bring it all to you. But I hope that in the end, you will have gained a useful program and a good working knowledge of SAM BASIC. We shall work in MODE 4 - the startup mode.

Whenever you type in any SAM BASIC, I suggest you first enter LIST FORMAT 2 as a direct command. This will give you a listing in which subroutine lines, those after IF, DO, etc., are indented by two spaces, so you can see at a glance where the subroutines are, and if there are nested subroutines. It is a great help in seeing the program structure. LIST FORMAT 1 does the same thing, but indents only one space at a time.

There isn't really any call for SAM's excellent graphics and sound capabilities in a program like this, so I have cheated a bit and written a loading screen - well - every good program has one. If you type in Listing 1 and RUN it, you will see a demented £1 coin dashing wildly about the screen, and then 10 orderly £1 coins lined up around the program

title, and you will hear a short burst of music - the old ABBA hit "Money, money, money".

```
 10 OPEN TO 10
    CLEAR 163840
 20 PALETTE
    BORDER 1
    PAPER 1
    PEN 7
    CLS
    CSIZE 8,8
 30 OPEN SCREEN 2,4
    SCREEN 2
    DISPLAY 1
 40 LET A$=CHR$ 238,B$=STRING$(8,A$)
 50 LET A$=CHR$ 0,C$=STRING$(8,A$)
 60 LET D$=B$+C$,A$=STRING$(8,D$)
 70 CIRCLE PEN 14;129,103,12
 80 PLOT 127,91
    DRAW PEN 14; 0,24,3
 90 FILL PEN 14,125,100
100 FILL USING A$, 140,100
110 CSIZE 8,16
120 PRINT AT 4,15; PEN 0; PAPER 14;"
    £1"
130 CSIZE 8,8
140 GRAB A$,116,117,31,28
150 SCREEN 1
    CLOSE SCREEN 2
160 FOR T=1 TO 20
170   LET X=RND(150),Y=RND(160)
180   IF X<10 THEN LET X=X+10
190   IF Y<10 THEN LET Y=Y+10
200   CLS
      PUT X,Y,A$
210   PAUSE 7
220 NEXT T
230 CLS
240 PUT 30,150,A$
250 PUT 70,150,A$
260 PUT 110,150,A$
270 PUT 150,150,A$
280 PUT 190,150,A$
290 PUT 30,36,A$
300 PUT 70,36,A$
310 PUT 110,36,A$
320 PUT 150,36,A$
330 PUT 190,36,A$
340 PALETTE 6,59,85
350 CSIZE 8,16
360 PRINT AT 4,9; PAPER 6; PEN 0;"MO
    NEY MANAGER"
370 CSIZE 8,8
380 PALETTE 5,11
390 PRINT AT 11,14; PEN 5;"by"
400 PRINT AT 13,7; PEN 6;"CAROL  BRO
    OKSBANK"
410 PRINT AT 15,9; PEN 5;"(c) FORMAT
    1990"
420 LET C=33,CS=60,D=85,DS=109,E=132
    ,F=153,FS=173,G=192,GS=210,A=227
    ,AS=243,B=5
430 FOR R=0 TO 31
      SOUND R,0
    NEXT R
440 FOR X=1 TO 6
      PLAY
    NEXT X
450 FOR R=1 TO 31
      SOUND R,0
    NEXT R
    PAUSE 7
460 FOR X=1 TO 4
      PLAY
    NEXT X
470 FOR R=1 TO 31
      SOUND R,0
    NEXT R
    PAUSE 7
480 FOR X=1 TO 5
      PLAY
    NEXT X
490 FOR R=1 TO 31
      SOUND R,0
    NEXT R
500 LOAD "ACCOUNTS"
510 DEF PROC PLAY
      SOUND 20,63
520   SOUND 28,1
530   LET METRONOME=2
540   READ L,N1,O1,N2,O2,N3,O3
550   SOUND 8,N1;9,N1;10,N2;11,N2;12
      ,N3;13,N3
560   SOUND 16,O1-1+(O1*16);17,O2-1+
      (O2*16);18,O3-1+(O3*16)
570   FOR V=15 TO 2 STEP -(METRONOME
      /L)
580     LET VOL1=INT V
        LET VOL2=240-(INT V)*16
590     SOUND 0,VOL1;1,VOL2;2,VOL2;3
        ,VOL1;4,VOL1;5,VOL2
600   NEXT V
610 END PROC
620 DATA 2,D,3,A,3,A,3
630 DATA 2,G,3,B,3,B,3
640 DATA 2,G,3,G,3,C,4
650 DATA 2,D,3,A,3,A,3
660 DATA 2,G,3,B,3,B,3
670 DATA 2,G,3,C,3,C,4
680 DATA 1,G,3,B,3,B,3
690 DATA 2,F,3,A,3,A,3
700 DATA 2,E,3,B,3,B,3
710 DATA 2,G,3,C,4,C,4
720 DATA 2,E,3,B,3,B,3
730 DATA 2,F,3,A,3,A,3
```

```
740 DATA 1,C,2,C,3,C,4
750 DATA 4,C,2,C,3,C,4
760 DATA 4,A,2,A,3,A,3
```

In line 10 we meet the first new SAM command - OPEN TO - which is used to allocate a number of memory pages, in this case 10, to BASIC. On a 256K SAM there are 16 pages, each with 16384 bytes. Since this program is entirely BASIC, we have no need to save any space for machine code. We shall, however, be using two Mode 4 screens, and they need two pages each. Those who have a disc drive will find that two screens plus the DOS will take up the top six pages in memory, so we are allocating the remaining ten pages to BASIC. This means that the program will run on any SAM with a ROM v.2 - the extra memory on the 512K machine is simply not used. Once the pages have been allocated to BASIC, the CLEAR command is used to set RAMTOP at 16384*10, so that we can actually use them.

In line 20, the colours and print size are initialised. PALETTE sets the colours to those available on power-up, just in case you load the program after you have been changing any of them. We are using a blue background and white lettering. CSIZE 8,8 sets the lettering size in pixels. On SAM, the normal CSIZE is 8,9, because for some strange reason the character set ascenders go right to the top of the 8*8 pixel character square, and the descenders right to the bottom. To avoid the tail of a 'g' on one line touching the top of an 'h' on the next, an extra blank line is inserted between each line of characters - CSIZE 8,9. But we are going to have to live with occasional letters touching, because we shall be using a lot of instruction screens, and CSIZE 8,8 lets you get a couple of extra lines of characters on the screen. However you could try designing a better character set for yourself or even load a copy of the Spectrum character set.

The coin is quite a simple sprite - a yellow circle with '£1' in black on it, and a crescent-shaped piece on the right, filled with yellow and black horizontal stripes, to represent the milled edge. Since we are working in BASIC, the drawing and filling would be visible, so in line 30 we open a second Mode 4 screen, on which the sprite can be drawn - OPEN SCREEN 2,4. SCREEN 2 makes this the current screen, but DISPLAY 1 means that Screen 1 is visible on the TV/monitor, so the sprite build-up can take place in decent privacy on screen 2. When the coin first appears in sight it will be complete. If you want to see how amateurish it would be to have the build-up on screen, try knocking out DISPLAY 1 temporarily.

Lines 40 to 60 define a fill pattern of horizontal stripes of yellow and black in the string A$, using colours 14 (yellow) and 0 (black). A Mode 4 screen file byte holds the colour information for two pixels, the left pixel's colour in the higher nibble, bits 4-7, and the right pixel's colour in the lower nibble, bits 0-3. The whole byte holds 16*left colour + right colour. Since we need a horizontal line of pixels in colour 14, all the bytes will hold 16*14+14 = 238. Line 40 first sets up A$ holding CHR$ 238 - for one screen file byte. But in order for this to work, we have to multiply everything by 8, and the STRING$ command sets up another string, B$, holding 8 copies of A$.

The other line of pixels are to be coloured black, colour 0, so the bytes for that stripe will all hold 0. Line 50 sets up the black stripe. We now have B$ holding the information for the yellow stripe, and C$ the black. To make a fill pattern, we have to put them together in D$ in line 60, and finally, make A$ hold 8 copies of D$. We now have A$ holding the fill pattern for the milled edge of the coin. We could have got the same effect by drawing a striped area on screen, and using GRAB to copy a little patch into A$, but that would have taken longer when the program is running.

Lines 70 and 80 draw the circle and the crescent-shaped extension. DRAW

with x,y co-ordinates and an angle specified draws a curved line. Line 90 fills the circle with colour 14 - you must use PEN to fill with a colour. If you try to use PAPER it will ignore whatever colour you specify and fill with the current PEN colour. The fill starts from the co-ordinates specified and goes to the edge of the shape. If your co-ordinates were outside the circle, everything but the circle would be filled. In line 100, FILL USING A$ will fill the crescent shape with our horizontal lines.

Line 110 doubles the height of the lettering, while we print '£1' on the coin in line 120. Line 130 returns us to the normal size lettering. We have now finished with the horizontal fill, so A$ can be used to GRAB the little patch of screen on which the coin is drawn. 116 and 117 are the x,y co-ordinates of the top left corner of the patch, and 31 and 28 its width and depth.

We have now finished the secret business on screen 2, so line 150 makes screen 1 current and closes screen 2. Lines 160 to 220 are a simple FOR-NEXT loop which rapidly dot copies of the coin at random about the screen. Line 170 chooses random x,y co-ordinates, making sure by limiting the numbers to 150 and 160 that co-ordinates chosen are not too near the screen edge. Lines 180 and 190 ensure that co-ordinates in the lower range are also well away from the screen edge. Line 200 PUTs the coin, held in A$, using the random co-ordinates as the top left corner. PAUSE 7 slows down the coin's dashing about. If you want to see just how fast SAM's sprites can move using PUT, try deleting the PAUSE. Lines 240 to 330 draw the 10 static coins in fig. 1.

In line 340, by allocating two hues to screen colour number 6, using PALETTE 6,59,85, we have a colour which flashes, alternating between the two. Used as the PAPER colour in line 360, the background flashes, as the PEN colour in line 400, the lettering flashes. PALETTE entered by itself would clear you back to the normal colours. Try playing about with various combinations of hues, and try poking different values into SVAR 8, the system variable which controls the flashing speed.

POKE and PEEK SVAR are commands used to alter or read the system variables. Where you need to know or change the number held in two bytes, DPEEK and DPOKE will automatically do the calculation PEEK x+256*PEEK (x+1) for you and either give you the number held in two bytes, or poke the correct numbers into them.

The handbook is very vague about how you make three-note chords, so if you want to make music, the next piece of program may help. I admit that I arrived at it after long hours of poring over the music section of the demo tape, and comparing it with the information in Philips' technical description of the sound chip.

In line 420, each tone in the tonic scale is given its usual note letter. (CS stands for C sharp). I did not invent these numbers - they are offically documented by Philips. The octave number determines which C, D etc. you get - middle C being in octave 3.

Line 430 clears all the sound registers. You need to do that again at the end of the music. If you don't, the last note plays on forever, or until you turn SAM off in desperation.

The routine which plays each chord is a procedure called PLAY, lines 510 to 600. We shall be using procedures a lot in this program. They are like a GOSUB subroutine, but they are called by simply entering the procedure name, and they can have their own LOCAL variables which do not affect the variables used by the main program. Variables can also be passed in and out of them. They can be entered anywhere in the program, because they are ignored until they are called by name - unlike a GOSUB subroutine which you must jump past.

Lines 510 and 520 enable the sound channels and the sound chip. In line 510, 63 is BIN 00111111 which activates bits 0 to 5 of the frequency register. Bits 6 and 7 of that register are unused.

Line 530 sets the speed. You use higher numbers to speed it up, and they need not be integers. Quite small fractions can make a big difference.

Lines 540, 550 and 560 read the chord details from the DATA, and send them to the registers. Line 570 governs the way the note sounds and dies away. This is a suitable 'envelope' for music, but for sound effects you could play around with the V loop to get sounds which are sharper or die away more quickly. Lines 580 and 590 send the volume to the registers. The different volumes in line 580 are to give a stereo effect. If you look at the binary form of numbers sent to the amplifier registers, bits 0 to 3 control the left channel and bits 4 to 7 the right. So, if V=10, its binary form is 00001010 and VOL1 would control the left channel only. VOL2 would be 240-10*16=80 (remember computers do the multiplication first), BIN 01010000 controlling the right channel.

Each line of the data gives first the note length (lengths in relation to each other), and then the note letter and octave number of each of the three notes in the chord.

PLAY is called repeatedly between lines 440 and 480, to play the chords. Where a rest is needed, the registers are cleared and a PAUSE used. You have to try out various PAUSE lengths to get the right one, unless you are so musical that you know how many fiftieths of a second a rest should be!

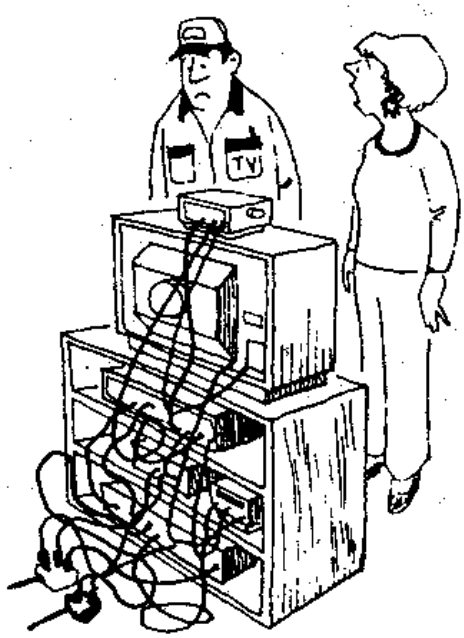
If you are still baffled by the technicalities of sound registers - and without Philips' tables and diagrams it is difficult to follow - you can now make music by using PLAY as it stands, changing only the METRONOME speed to suit yourself. Then you will only have to write the chord DATA lines, which are quite straighforward. Each one has a note length followed by the 'tenor' note letter and its octave, then the 'alto' note and its octave and lastly the 'soprano' note and its octave. Write the line which allocates the notes to the letters just as I have, and a series of loops to call PLAY for each chord.

SAVE the loading screen BASIC for now as:-

```
SAVE "LOADER".
```

We shall return to it when the program is complete. If you want to RUN the program to try it out, delete LOAD "ACCOUNTS" in line 500, or change it to STOP.

That is all we have time for this month. Next month we shall start on the main program itself. We have about 35K of BASIC to type in over the next few months, so I am going to keep you busy. See you then.



My husband thinks it might be a loose wire!

NEV'S HELP PAGE

By:- Nev Young.

R.Huges of Littlehampton has a frustrating problem, or at least it will be when he reads this. When he first got his PLUS D he set the system file up for single sided discs. He now finds that if he does the setup again but sets double sided he has over 300K of space on each disc but he can not use it, why?

Imagine your disc as a sheet of paper. When it is new it is completly empty. Before you can write onto this paper you must first draw lines on it. You do this by FORMATing. If you have only a single sided drive you can only draw the lines on one side. Trying to draw on both will not work. However if you have a double sided drive you can draw on both sides of the paper. Your problem is even though you have a double sided drive you have only drawn the lines on one side.

Now you have changed the setup when you do a CATalogue the size of all the files are totalled and that total subtracted from the amount of space on a blank disk er sorry sheet of paper. You can not use this extra space because you can not write data onto the disc (or paper) as there are no lines to write on, on the second side.

Of course you don't draw lines on a disc when you FORMAT the disc you write blank sectors on to the disc. Your programs, data files, snapshots etc are written into these blank sectors. There are no sectors on the second side of your disc. To use both sides you must FORMAT the discs once more now that you have setup for a two sided drive both sides of the disc will be written. Now you have a real problem. When you FORMAT the discs again you will lose all of your programs.

What you need to do is get a new disc FORMAT it and then copy all the files on one of your single sided discs to this new disc. FORMAT the old disc and copy everything back. As you say the discs are full of snapshots then you will have to use one of the special file copying programs. I would recomend DBU from SD Software (but then I would wouldn't I).

A few months ago I passed on a plea for help from a Tasword+2 user who found that some features no longer worked after the TASCON convertion. Stephen Holland who wrote the TASCON program has sent the following programs to fix the prolem.

```
 10 REM  TASCON128 BUGHUNTER.
 20 REM
 30 REM       S HOLLAND.
 40 REM
 50 REM FIX FOR PRINT/&No/&& FILES.
 60 REM
 70 CLEAR 25299
 80 PRINT #0;AT 0,0;"Insert TASWORD d
    isc in drive 1. Press any key."
 90 PAUSE 0
100 LOAD d1"tascode" CODE 25300
110 LET a=0
120 IF PEEK 29298=205 THEN LET a=1
130 POKE 26227,181: POKE 26228,240: P
    OKE 29597+a,56
140 RESTORE
150 FOR C=61625 TO 61657
160 READ B: POKE C,B: NEXT C
170 POKE 27667+a,27: POKE 27668+a,45
180 SAVE d1"tascode"CODE 25300,40239:
    VERIFY d1"tascode"CODE
190 NEW
200 DATA 245,197,213,229,197,62,32,6,
    8,17,3+a,203,213,18,19,16,252,209
    ,193,126,35,18,19,16,250,225,209,
    193,241,205,154+a,108,201
```

```
 10 REM  TASCON+2  BUGHUNTER.
 20 REM
 30 REM       S HOLLAND.
 40 REM
```

```
 50 REM FIX FOR PRINT/&No/&& FILES.
 60 REM
 70 CLEAR 25299
 80 PRINT #0;AT 0,0;"Insert TASWORD d
    isc in drive 1. Press any key."
 90 PAUSE 0
100 LOAD d1"tascode" CODE 25300
110 POKE 26254,181: POKE 26225,240: P
    OKE 29605,56
120 RESTORE
130 FOR A=61621 TO 61653
140 READ B: POKE A,B: NEXT A
150 POKE 27694,27: POKE 27695,45
160 REM
170 REM FIX FOR CAT.
180 REM
190 POKE 61104,195: POKE 61105,143: P
    OKE 61106,128
200 POKE 32924,195: POKE 32925,183: P
    OKE 32926,238
210 SAVE d1"tascode"CODE 25300,40239:
    VERIFY d1"tascode"CODE
220 NEW
230 DATA 245,197,213,229,197,62,32,6,
    8,17,2,204,213,18,19,16,252,209,1
    93,126,35,18,19,16,250,225,209,19
    3,241,205,181,108,201
```

Many thanks Stephen.

Per-Arne Peterson of Degerfors would like to build a printer cable for his PLUS D. The pin allocations on the PLUS D are as follows:-

1	Printer strobe	OUT
3	Data 0	OUT
5	Data 1	OUT
7	Data 2	OUT
9	Data 3	OUT
11	Data 4	OUT
13	Data 5	OUT
15	Data 6	OUT
17	Data 7	OUT
19	no connection	
21	Printer busy	IN
23	No connection	
25	No connection	

Pins 2 to 22 (all even numbers) are 0 volts (ground)

It is the same cable that is used by the BBC micro and I would have thought it was readily available. If not you can get the parts to build one from MAPLINS (phone 0702 552911 or write to MAPLIN ELECTRONICS plc, P.O. Box 3, Rayleigh, Essex, SS6 8LR. England. to get current prices and carriage conditions)

The parts you want are:-

FG85G (2x13 dil IDC Socket) x 1
FJ62S (IDC Centronix 36Wplg) x 1
XR75Ş (Flat IDC Cable 26way) sold in 30 cm lengths.

Please mention FORMAT if you contact them.

Colin Rout of Hastings is trying to get Address Manager to work with an Inter-Printer. Now I don't have such a device, or the program come to that, but looking through the code you sent me I would think that what you need to do is load the Inter-Printer code and then load Address manager to use the ZX printer. I think this should work unless the two programs use the same memory. The Inter-Printer initialisation routine appears to overwrite the printer channel so that all output to the ZX printer channel should access the centronix interface.

Daniel Oram of Ricksmanworth has decided, after many years of programming in basic, to delve into machine code programming and would like to know of some books for beginners. I went down to my local library and did a search on Z80 and found over 30 books. They range from very much beginners to very complex. It is also a very cheap way of looking at many books.

Another way of breaking into machine code is to buy a good assembler. They usually have some good hints at machine code programming.

Books that I would recommend are:-

Introducing SPECTRUM Machine Code by Ian Sinclair ISBN 0 246 12082 7
Spectrum Machine Code Made Easy by Paul Holmes ISBN 0 907563 44 9

Now to the SAM. D.E.Piggot of Ashford wants many things but mainly a DTP and wordprocessing package for his SAM Coupe. At this time I only know of

the SAM Tasword II word processor. If you want to run the DTP package from PGC then either wait for the SAM version or you can run the spectrum (PLUS D) version on SAM using the SPECMAKER program.

Peter Williamson would like the mysteries of SAM memory explained. I think the article in issue 3/5 covers that quite well.

Ian Bo7ham would like to know how to move sprites around on SAM without destroying the background. On SAM this is quite easy. There are several steps:-

1. create the sprite and GRAB it.
2. create a mask for the sprite.
3. Create the background.
4. GRAB the background and PUT the sprite.
5. change the sprite position.
6. PUT the background.
7. goto 4.

For example:-

```
 10 REM DRAW SPRITE
 20 PLOT 9,100
    DRAW 6,0
    DRAW -2,-2
    DRAW 4,-4
    DRAW -2,-2
    DRAW -4,4
    DRAW -2,-2
    DRAW 0,5
 30 REM GRAB SPRITE
 40 GRAB X$,8,101,10,10
 50 REM CREATE MASK
 60 FILL PEN 15;10,99
 70 REM GRAB MASK
 80 GRAB Z$,8,101,10,10
 90 REM CREATE BACKGROUND
100 PAPER 1
110 CLS
120 FOR N = 1 TO 1000
130  PLOT PEN RND(16);RND(255,RND(170)
140 NEXT N
150 REM MAIN LOOP
160 LET A1=8,B1=101
170 DO
180  REM GRAB BACKGROUND
190  GRAB W$,A1,B1,10,10
200  REM PUT SPRITE
210  PUT A1,B1,X$,Z$
220  REM CALC NEW POSITION
230  DO
      LET V = CODE INKEY$
     LOOP UNTIL V
240  LET A=A1,B=B1
250  LET B=B+(V=11)-(V=10)
260  LET A=A+(V=9)-(V=8)
290  IF A>255 THEN LET A=0
300  IF A<0 THEN LET A=255
310  IF B<8 THEN LET B=170
320  IF B > 170 THEN LET B=8
330  REM RESTORE BACKGROUND
340  PUT A1,B1,W$
350  LET A1=A,B1=B
360 LOOP
```

And finally: Three pleas for help from Debu Dutta in Bombay.

1. Why can I still not get DFLIP to work?

2. What is the address of SD Software?

3. How do I copy FILE MASTER onto 3.5" disk?

in reverse order

3. You can not copy FILE MASTER from 5.25" to 3.5" disk as it is copy protected. Write to Betterbytes and they will be only to happy to come to a suitable arrangement to replace your original disc with a 3.5". Although you say direct imports of software into India is difficult both Betterbytes and SD Software have had no problems sending it. (The only problem with India is one copy gets sent and then it is pirated. Hence the copy protection).

2. The address is elsewhere in this copy of FORMAT. (Were you serious?)

1. Murphy's law #1:- **If you make something fool proof somebody will still get it wrong.**

The DFLIP program (pokeloader) had a check digit. As you state that when you run it the check digit fails, 33098 instead of 33152 then this does not mean the check is wrong, it means you have entered the data wrong.

So how could you find that error? A bit of applied maths will help. The

difference in the actual check digit and the generated check digit was 54. So what could be wrong?

1. The number 54 was missed out: thats not it as it would generate the error "OUT OF DATA"

2. A number was entered 54 less than it should be: probable. The most common way of doing this is to transpose two digits in a number. So what two digit numbers are 54 less when their digits are reversed. If the digits are x & y then we can say

```
   10x + y = 10y + x + 54
so 9x - 9y =54
so x - y = 6
```

which gives possible values for xy of 93, 82, 71, 60 that may have been written as 39, 28, 17, 06

So look at the listing for every number ending in 39. OK Check every number ending in 28. OK Check every number ending in 17. OK Check every number ending in 06. Line 290 is wrong.

And there is your problem.

If this method fails to find the problem I usually type the entire program in again from the original listing. It is most unlikely that you will make the same mistake twice.

Well thats all for this month. Keep those letters coming. I will answer as many queries as possible but only through the magazine so please do not send me return postage etc.

Write ONLY to Nev Young at:-

FORMAT Help Line,
3, Mitchell Place,
Falkirk,
Stirlingshire,
Scotland,
FK1 5PJ.

+ + + + + + +

By:- Paul Rigby.

Good grief, I can see all the same faces! Nice to see you back in the same seats as last month. I am sure you are eager to read part two of Format's exclusive interview with the technical bods from Magnetic Scrolls. So without further ado...

Last month I chatted to the lads about their assembler coding, their DEC system, tracking bugs and so on. On the subject of assembler, is this the primary langauge? "We write as little assembler as possible. The actual games themselves are written in pseudo-code, which is then interpreted by our DEC. Traditionally, though, the 68000 machines have had a lot of assembler because we started out that way. The 8086 PCs have a lot because you need it to boost performance. In the Archimedes version it is entirely written in C. This is a special case because the Arch's development system was a kind of brother to the system we use for the UNIX machines. The interpreter part of this system is written in C. It was easy to port to the Arch. The Archimedes was fast enough to run the game under C. For the future stuff there'll be quite a lot of C in all versions."

You don't really write assembler unless you really have to - believe me, it's horrible!! So what Magnetic Scrolls have done, in the past, with their games, has been an essential requirement. This may be surprising to some people to hear that a text/graphic adventure needs this power - it surprised me I'll tell you!

I couldn't resist asking about the comparison's between the ST and Amiga. "Well, they're both a pain in the neck, in many respects! We spent a very short time using STs as development machines and it was grief with a capital G! For example, I was searching the office for invoices today because I've got two dead 1040STs that have to be returned for repair. They are only five months old! That is just typical of STs. If you came around here you'd find half the STs without any screws in at all. So we can quickly take the lid off and push the chips back in! The reason the rest still have their screws is because they are still under warranty! We have another half a dozen which just don't work at all.

"The Amiga tends to break less. Only one has died and that was a couple of years old. However, Amiga discs go down more often. On the programming point of view it is slightly easier to program an ST than an Amiga. You have to know less about the ST to get simple things to work. Our earlier stuff on the Amiga took longer than the ST, for sure. Although, that's due to the Amiga's higher learning curve."

Although, later in the conversation the lads did say that the Amiga was easier in some respects because it has more powerful screen modes. So you worry less about the choice of colours, consequently the artists have an easier time of it.

Speaking of art. The Scrolls team commented that there is a certain limit to how far you can really go, as far as gameplay is concerned, with pictures and the present hardware. Not just the fact of how many colours you can have on-screen at once, but the mere fact that the game has to load

each one. If you included high-res pictures in a graphic adventure it'd take so long to load each picture from disc that the player would turn them off through boredom and frustration. So Magnetic Scrolls believe a balance must be found. I did wonder, though, whether Scrolls had ever considered digitising their screens,

"The title pictures are all digitised from the artwork. Every picture we have ever shipped in the games has been hand drawn. Actually, one of our artists went on at me for ages to give digitisation a shot. We took a few paintings he'd made and digitised those. But he changed his mind. Mainly because it is very difficult to take a digitised image and make it look as good as a hand-drawn image. You are getting two processes that are trying to do the same thing and they get in each other's way. If you digitise something the digitising software introduces different levels of grey, for example, into your picture. If you were doing this by hand you would, maybe, use a stipple instead. So you would get less palette entries and more varied colours. With digitising you end up with seven greens, three reds and so on. They end up looking very flat." You can't even hand-draw over a digitised picture with any success, according to Scrolls, because it looks obvious and false.

Stipple, by the way, is the effect of making more colours appear on screen than there actually are. So if you put red next to grey you'll get a sort of pinky colour. Imagine you have some trees near you and some trees in the distance. The distant trees could have a green blue stipple while the nearby trees would have a richer green mix. Hence stippling can enhance distance between objects. Magnetic Scrolls uses trained artists for this.

I wondered whether Mag. Scrolls had ever dabbled in high performance graphic hardware/software, "Yea, a little bit. I once nicked a space shuttle of a Quantel Paintbox. The interesting thing about the Paintbox is that they come with hardiscs with a couple of hundred megabytes of capacity. But they don't go very far because each image takes one megabyte!"

One question I was dying to ask was whether Mag. Scrolls ever considered an artificial intelligence language. Infocom used LISP, which has AI features, "That might be a better way of doing it than the way we do it - but, then, that's our problem. The end result will be no different. There is a hassle, though, which is the speed. Lisp can be a lot slower than more simple systems. PROLOG is even easier to program but you use more of the computer's resources. Actually, I don't think the end-user would know the difference between a game coded in assembler and one coded in LISP. AI languages are a misnomer because there's nothing intrinsically intelligent about them. They are just easier to use, compared to assembler, for example."

Right, that's the end of that! As far as the technical aspects are concerned, anyway. Maybe we could investigate the other aspects of adventure design, such as puzzle construction, another time. But for now we'll say farewell and thankyou to the bods at Magnetic Scrolls.

Next month expect to see a change or two in the Corner. Expect to see - reviews!! Gasp, eh? We have resisted reviews up until now, as we tried to create a column which was just a little bit different from the columns you see in the glossies. However, one or two of you have asked for their introduction so, as I keep saying, this is your column and I am here to serve. Please tell me what you think, though. If, after next month, you want more reviews then say so. If you want hints and tips, write in. If there are any games you would like me to review (old or new) let me know. If there is any other aspect of adventuring which you consider to be lacking in the Corner - don't keep it to yourself, put pen/finger to paper/keyboard! So until next month, fare thee well.

SMALL ADS SMALL ADS

FOR SALE Spectrum 128; PLUS D disc interface; TwoFace; Multiface 128; Dk'Tronics programmable joystick interface; Interface One + 2 Microdrives. Plus various books, games & accessories. £150 ono. Phone Ken on 071-733-6508.

WANTED Working programmes of The Artist and The Writer. Phone 0328 700250.

SAM Coupé with disc drive and external drive/printer interface including lead. 7 months old. £200 ono. Also loads of Spectrum software from £1 each. Please ring Steve Rigby on 051-928-0348 after 5pm.

WANTED Any information or manuals on an Epson SQ 2000 printer. Please ring Steve on 0782-332645 after 8pm.

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